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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/706,531

11/12/2003

Daniel L. Baseman

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03/22/2006

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EXAMINER

KIM, PAUL D

ART UNIT

PAPER NUMBER

3729

DATE MAILED: 03/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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| | | | |
|------------------------------|--------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/706,531 | Applicant(s) BASEMAN ET AL. | |
| | Examiner Paul D. Kim | Art Unit 3729 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 12-20 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-11 is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>6/17/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This office action is a response to the election of species filed on 2/8/2006.

Response to the Election of Species

1. Applicant's election with traverse of Species A, claims 1-11, in the reply filed on 2/8/2006 is acknowledged. The traversal is on the ground that examiner relies just one step in the overall method. This is not found persuasive because applicant did not distinctly and specifically point out the supposed errors in the election of species. In addition, the non-elected Species B has a limitation such as at least one ferromagnetic layer, which is not the same as the plurality of magnetoresistive device layers as recited in Species A. Also, the non-elected another Species B (It was a typo and it should be referred as Species C) has a limitation such as a plurality of GMR device layers formed on a first silicon nitride, which is not the same with Species A because the plurality of magnetoresistive device layers are formed on the oxide layer as recited in Species A.

The requirement is still deemed proper and is therefore **made FINAL**.

2. Claims 12-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 2/8/2006.

3. This application is in condition for allowance except for the following formal matters:

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IN THE SPECIFICATION

The phrase "second silicon nitride layer 114" as described inline 17 appears to be --second silicon nitride layer 112--.

The phrase "first silicon nitride layer 102" as described inline 18 appears to be --second silicon nitride layer 104--.

IN THE CLAIM

Cancelled the non-elect claims 12-20.

Re. Claim 4: The phrase "wherein said oxygen barrier further comprises a silicon nitride layer" as recited in line 1-2 is not clear. According to the specification, lines 12-14 on page 14, the photoresist layer and first silicon nitride layer together act as an oxygen barrier to protect the magnetoresistive layers from exposure to oxygen. Therefore, the first silicon nitride layer cannot be the photoresist layer. Clarification is required.

Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.

4. The following is an examiner's statement of reasons for allowance: The prior art of record fails to disclose the claimed invention such as the magnetoresistive layers are formed on the oxide layer and etching into the oxide layer while the magnetoresistive

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layers are covered with an oxygen barrier. The closest reference of Liu et al. teach a process of making a magnetoresistive device including a process of forming the magnetoresistive layers on a silicon nitride layer, wherein a etch stop layer is formed on the magnetoresistive device layers. However, Liu et al. fail to teach an oxide layer where the magnetoresistive device layers is formed and the oxygen barrier layer is formed after etching the magnetoresistive layers and the etch stop layer. Liu et al. fail to teach a process of etching into the oxide layer after the oxygen barrier layer is formed. Therefore, it would not be obvious to modify Liu et al. by adding any layer such as an oxygen layer to form the magnetoresistive layers, since doing so would destroy the structure of magnetoresistive device of Liu et al.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

5. Claims 1-11 are allowed.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul D. Kim whose telephone number is 571-272-4565. The examiner can normally be reached on Monday-Friday between 6:00 AM to 2:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Paul D Kim
Examiner
Art Unit 3729